

Mr. John Spear's Report to the Local Government Board upon the Prevalence of Scarlatina in the Yeadon Urban Sanitary District, and upon the General Sanitary Condition of that District.

EDWARD C. SEATON, M.D.,
Medical Department,
 October 4, 1879.

The Registrar-General's returns had shown that in the sub-registration district of Yeadon there had been, during the latter part of 1878 and the first quarter of 1879, an excessive mortality from scarlatina, and on further inquiry it was found that this mortality was almost exclusively confined to the Urban Sanitary District of Yeadon, situated within that registration sub-district. Having regard to this circumstance, and to the fact that certain representations had been made to the Board by the Local Authority of the district named, attributing the excessive mortality therein partly to the unsatisfactory character of the water supply with which the district is furnished by a private company, an inquiry was ordered; and I was honoured with instructions accordingly.

General Description.—The township of Yeadon comprises an area of 1,723 acres; the surface has a gradual slope towards the south-west, the elevation ranging from 408 to 650 feet above ordnance datum, and the surface soil consists of superficial beds of clay and sand which overlie the sandstone rock. The township consists of one long straggling street (High Street), around which at one point are gathered, in close but anything but picturesque confusion, lanes, and courts, and squares, nearly all unpaved, hitherto mostly unsewered, and altogether presenting a very dirty and unwholesome aspect. In addition, there are two or three outlying districts of, in point of population, little importance—Henshaw, Wild-Duck, and Kirk Lane, the latter composed largely of houses of recent construction. The population in 1861 was 4,259, in 1871 5,246, and for the present year it may be estimated at 5,700; a population which is mainly employed in the woollen manufacture.

Prevalence of Scarlatina.—An examination of the death register for the Yeadon Registration District shows that scarlet fever was fatally prevalent in the autumn of 1874 and early months of 1875; from that time until December 1877 (two years and nine months) no death from this cause was recorded. In December 1877 there was one death registered at Baildon, and in the following February another at Guisley, parts of the registration district comparatively remote from each other and from Yeadon. From this time until the following August no death from scarlet fever in the Sub-registration District of Yeadon was recorded; but in the third quarter of the year now under consideration (1878) there were four deaths so registered, all of which were in the Yeadon Urban Sanitary District, in the following quarter there were 17 deaths, all likewise within that district, and in the first quarter of 1879 there were 14 deaths so registered, 11 of which were in the sanitary district named. The number of cases of sickness that occurred during this period is variously estimated at from 300 to 500; and I should say, judging from my own observation, that the latter is within the actual number. The disease in some streets appeared to have been in almost every house; and a large proportion of the sufferers, as I learned from parents of children who had suffered and from chemists who had prescribed for such cases, were unattended by a medical practitioner. The evidence that was obtainable from schools also, as to the excessive prevalence of the disease, was striking. Some 890 children, or 75 per cent. of the total number of children at the school age in the district, are educated at one or other of the Board schools; and the average attendance at these schools dropped from 518 in the summer to 219 in December, the prevalent sickness being the sole cause assignable. The disease, there can be no question, was violently epidemic; and, what is more, the township of Yeadon formed a centre of infection to the districts around. I heard of cases of the disease being conveyed thence to Bramhope, Stainburn, Pool, and Guisley—neighbouring villages. At the date of my visit the epidemic had subsided at Yeadon. I saw only one or two cases in the acute stage of scarlatina; several were convalescing from the disease, and others were suffering from its sequelæ.

Circumstances of the Outbreak.—In searching for the cause of this epidemic, interest, of course, centres in the early cases, more especially as the sanitary circumstances under which the people live at Yeadon were found to be such as to offer every explanation for

the wide diffusion of the disease and its fatality afterwards experienced. Accordingly, no pains were spared to discover the first cases that occurred and to trace their origin. Inquiries were made in every street and court of the district, every rumour of early cases was inquired into, and the home of every child that had been absent from the public schools in the summer on account of sickness was visited. So far as these inquiries could show, the first case that occurred in the district was in the person of a child named Brown, aged five years, living in Queen Street. He sickened on August the 3rd, 1878, but every inquiry failed to show the source of his infection. His brother, aged seven years, sickened on the 13th, and died six days later. Meanwhile, on the 10th of the month, Albert Child, aged three years, living in Booth's Yard, who did not go to school, contracted the disease; he died on the 18th, as did also a sister, taken ill later, on the 24th of the same month. Beyond the fact that the last-named child went like the boys Brown to the infant school, no personal communication existed between the two families; they lived in different streets, and were not acquainted with each other. They both drank the water which has been accused of conveying the fever poison, and it was found that both had milk from the same farm. The latter circumstance, indeed, when it was discovered that the inmates of the farmhouse had been suffering from scarlet fever, promised to be of some significance, but inquiry at the farm showed the attacks there to have been at a more recent date.

After these first cases, an interval of a week or two apparently occurred, and then, in quick succession, houses at Saxton's Buildings, Wild-duck, High Street, Well Hill, Queen Street, and other places, were invaded. Very many of the sufferers were school children, most, if not all, at this early period, at least of the cases that we could discover, drank the suspected water, but as the same water is used by nearly 90 per cent. of the population, this fact goes for little. A circumstance however of more suspicion came to my knowledge at this stage of the inquiry. The Water Company supplies from the same works, in addition to Yeadon, about 300 houses in the neighbouring village of Rawdon, and, amongst them, in the summer months, when a private spring runs dry, a large boarding school for the education of the sons of Wesleyan ministers. In this school, as well as at one of the houses, occupied by a dairyman, at Rawdon, supplied by the Company, there was at about the time of the first case at Yeadon an unexplained outbreak of scarlet fever. In the dairyman's family all the children suffered; the first sickened quite at the beginning of August, the others at short intervals. These children attended a day school, but, as in the cases at Yeadon, I failed absolutely to obtain any evidence of the origin of the infection. At the Wesleyan school, eight boys out of 145 were attacked. The first case occurred on the 28th of July, the second and third on the following day, the fourth on the 7th of August, and the fifth and sixth on the 19th and 20th of that month. The school was then broken up in consequence of the outbreak, and two other boys were found to be sickening for the disease soon after reaching home. The cause of this outbreak, although it was the subject of skilled inquiry, was never definitely arrived at, although a strong and very possibly well founded suspicion prevailed that the infection was conveyed from the home of one of the boys (not one of the sufferers) where scarlatina was known to have appeared.*

Summary.—It will be seen that evidence is entirely wanting that will warrant even the expression of an opinion as to the origin of this epidemic. The water supply was supposed, as I have said, by some, to have been the means by which the fever contagion was distributed through the district; but although there were circumstances connected with it which aroused suspicion, their significance on further investigation was weakened rather than confirmed. In four houses, widely separated from each other, and having nothing in common but the water supply, scarlet fever (the cause of the outbreak in three at least of the cases not being even guessed at) appeared almost simultaneously. And this is about all that can be said. What part, if any, the water played in the subsequent diffusion of the disease, will never, for reasons I have already given, be determined. The water, a mass of testimony proves, has been, even to the casual observer, obviously impure; and as I shall presently show is exposed to both excremental and slop-water pollution. But assuming that such pollution actually occurred, still, evidence is wholly wanting (and such evidence was carefully sought for)

* In conversation with the head master another interesting fact was told me. Although the boys at the school have had, it was stated, on the whole the best of health, and I can speak to the careful supervision of the sanitary arrangements, a sort of mild epidemic sore throat has from time to time prevailed. No reason has ever been assigned, but so noticeable has it been, and so well recognized as exceptional, that the medical attendant of the school has given it the sobriquet of the Wood House Grove (the name of the school) sore throat. Can this be due to the use of a polluted water supply? The head master has promised to bear the possibility in mind in any future outbreak.

of its specific infection. Further, in epidemics that have been ascribed hitherto to the distribution of polluted water, more or less suddenness or apparent spontaneity in the outbreak, much more than was observed in this case, has been a marked characteristic; although having regard to the probable particulate nature of the scarlatinal contagion, it does not follow that its introduction into a body of water would lead to its equal or even general diffusion therein, or, consequently, that the characteristic referred to would necessarily be manifested in its effects. However, it cannot be said that this outbreak was peculiarly sudden in occurrence (not more so at any rate than I have observed myself in another case, where the outbreak was due to the congregation of children in a large day school); and as regards its incidence on families, the experience in scarlet fever epidemics, that in a large number of cases one member of a family is distinctly first infected, was generally observed.

It is worthy of record that at the time of this outbreak extensive sewerage works, in connexion with a general system of town sewerage, had been commenced. In nearly every part of the district old rubble drains were opened, and much sewage polluted earth, as I saw myself, disturbed. These operations formed for the time the main interest of the village children, and during the intervals of school time every sewer trench had its group of eager watchers. The child Brown, the one first in the district attacked, was, the mother told me, "always at the sewers," and there was often, she added, a "very bad smell." Indeed, so repeated were such occurrences that a conviction arose in the minds of many parents that a connexion existed between the sewer works and the sickness of their children. It is not impossible that they may have been the means of bringing into activity the germs of a former epidemic; the scarlatinal poison we know will retain its potency for lengthened periods.

Circumstances of the Diffusion.—If so much obscurity surrounds the first invasion of the disease, the reasons of its wide diffusion are only too obvious. The sanitary condition of the district is, as I shall have to show, wretched in the extreme. The Sanitary Authority appear to have put in force no preventive measures. No means of isolation were provided; nor was isolation, except in very exceptional cases, attempted at the sufferers' homes. Disinfectants were supplied by the authority in only a small proportion of the cases, and then they were practically useless, as the people were mostly left to their own devices as to the method of their use. Persons suffering from the fever were allowed, apparently unquestioned, to expose themselves in public places; things that had been exposed to infection were freely dealt with and transmitted. Milk has been sold from dairies by people convalescing from the disease (only a fortnight or even less after the date of attack); and articles from provision shops in which scarlatina cases were retained were served out by people in attendance on the sufferers. No special precautions were taken to prevent children imperfectly recovered from the fever from attending the schools, and there appears to have been at least no effectual prohibition against the attendance of children from infected homes. The congregation of children in the day schools, without proper precautions, no doubt contributed largely to the spread of the disease.

SANITARY CIRCUMSTANCES.

Water Supply.—The water supply of Yeadon, together with that of a part of the adjoining district of Rawdon, is furnished by a private company, incorporated in 1862.

The supply is on the so-called constant service principle, and the number of gallons afforded per head per day for all purposes, averages 12. The distribution, however, is very unequal, and in the higher parts of the district, so much is the pressure in the mains reduced, that the inhabitants are habitually deprived of their supply during several hours of the day, and often, I was told, for days continuously.

The supply is derived from two principal sources—

(1.) The surface drainage from 30 acres of gently sloping and somewhat elevated pasture and meadow land, having a surface soil of clay overlying the sandstone rock, with the water of one or two superficial springs; and (2) from two wells sunk in the sandstone, one to a depth of 90 feet, with a further bore hole of 180 feet, and the other to a depth of 70 feet. In the winter months the surface water, it is stated, may be collected in sufficient quantity to obviate altogether the necessity of pumping, and consequently the well water is not then used; in the summer, on the other hand, the latter constitutes the chief supply. During the time of my visit the manager informed me that they were pumping from the first or old well 396,000 gallons, and from the other 108,000 gallons, weekly, while the water derived directly from the surface amounted to 49,000 gallons in the same period. There are two reservoirs, described respectively as the old and new reservoirs, the former having a storage capacity equal to 4,000,000 gallons,

the latter to 2,000,000. They serve both for storage and service purposes; they are uncovered, and there is no attempt at filtration or other purifying process. The old or larger reservoir is fed from the deeper well, which receives, it is said, an abundant stream of water from its deep bore-hole, and from surface drainage; the smaller one is fed also from surface drainage, and from the more shallow well. The wells themselves are not protected from surface water, and the latter may be seen trickling down their sides. Into the new or more shallow one, indeed (the one feeding the new reservoir), a surface drain, which is laid in the bed of a roadside ditch, and which receives in its course the drainage from manured meadows, empties itself. This well is no doubt largely supplied by surface water. About 20 to 40 yards distant from it is a group of four houses known as the Grange, the drainage from which runs across the field in the direction of the well. The deep well is similarly unprotected, but it has only one house in its near neighbourhood (distant about 12 yards), and I do not know of surface water being purposely run into it.

The surface water is collected by means of common land tiles laid at a depth of, it was stated by the manager, two to four feet, which converge to socket jointed pipes laid quite superficially in the highway or field gutters, or natural drainage channels, and these in their turn communicate with the main pipe which supplies one or other of the two reservoirs. The pipes laid thus superficially draw the water from meadows manured with night soil, and from pasture land on which night soil, for convenience of the farmers, is deposited in large heaps, and on which cattle graze. They draw the water from ditches by the side of the highway and elsewhere, and in one case a pipe was laid to a field ditch with the evident deliberate intention of draining it; and night soil was deposited in its vicinity. The drains in their various course pass in near proximity to three more or less filthy and badly drained farmyards; and with the object of satisfying reserved rights there are at certain points breaks in their continuity, where cattle troughs are formed. The surface around these troughs is fouled by manure, and from two of them at least the overflow water returns directly to the water channel. The larger jointed pipes have only been recently provided, but now they are laid so superficially in the gutter beds and elsewhere, that some I saw uncovered, and although supposed to be jointed, with open joints. The main feeder of the old reservoir runs, just before its entrance into the latter, beneath a stone pavement within two yards of the manager's house; the pavement has gaping crevices, and the water, thus unprotected from surface and house washings at its last moment before reaching the reservoir, may be seen running just below. The system of water collection here disclosed it seems difficult to find words sufficiently to condemn.

Chemical Analysis of the Water.—Two samples were collected, one from each of the reservoirs, at a point where the influent waters, from the wells and from the surface, would be blended, and sent to Dr. Dupré for analysis. I append his report, as also one by Mr. Fairley, of Leeds, on analyses made by him last January, at the instance of the Water Company. It will be seen that they corroborate, more especially when read together, the opinion I have expressed as to the unwholesome character of this water. But if the analytical results had been in every respect favourable, still what I have written must have stood as the expression of my opinion; no number of favourable analyses of this water could be allowed to weigh against the fact that the physical circumstances of its collection are such as to involve the gravest risk, the almost absolute certainty, of its pollution. Chemical analysis, however, goes to show that this pollution has actually occurred. It is true that Dr. Dupré finds comparatively small indications of *previous animal contamination*, but when the source of supply and the circumstances of the water collection are known, this is to a great extent explained. The effluent water of fields irrigated with sewage does not contain the full evidence of the previous animal pollution, the nitrites, nitrates, and ammonia having been removed by the growing plants. The samples of this water that were submitted to analysis were taken at a period of the year when vegetation is most active; and again, at a period when after long continued rains it might be expected that the nitrates, &c. formed in the soil would have been washed from it and have been carried away. This view is strengthened by finding that in Mr. Fairley's analysis, made in January, of the new reservoir water (the one receiving, it will be remembered, the largest proportion of surface water), a notable, I may say, remembering the character of the water, even a large proportion of nitrogen in the form of a nitrate was found. On the other hand, referring again to the more recent analysis, the concurrence of an amount of albumenoid ammonia three times the maximum quantity that is supposed to exist in a moderately wholesome water; of a considerable amount of easily oxidized organic matter (the quantity of which must be expected to vary); of a

notable quantity of chlorine in an inland surface water, with coincident evidence of phosphoric acid, and of the existence of many low forms of animal and vegetable life, must be looked upon, as I have said, in a water shown on examination of its sources to be liable to excremental pollution, as proof that such pollution has actually occurred.

Independent Sources of Water Supply.—Parts of the township, comprising a population numbering about 800, are not supplied with water from the mains, but from semi-public wells and tanks. One of, until recently, the most frequented of these is situated at "Well Hill." The district is closely inhabited, and is built on the slope of a bank. The "well," as it is called, or catch-trough, is situated at the bottom of this bank, and receives the drainage from it. At the time of my visit it was so obviously polluted with slop-water that the people had generally discontinued its use, and were resorting mostly to one in Kirk Lane, which examination showed was scarcely less liable to contamination. In other cases, as at Booth Row, shallow wells, or mere "sump holes" (3 or 4 feet deep) were sunk in the cellars, the water being lifted by pumping to the ground floors. At Henshaw many of the inhabitants derive their supply from tanks fed by surface and, it is stated, superficial spring water, from adjacent meadow land.

In parts of the district thus supplied, owing to the considerable distances the people often have to go for water, a quite insufficient quantity for decency and cleanliness is used. At Well Hill I found several families were obtaining only a daily average of about two gallons per head, and a portion of this, that used for "cleaning purposes," was coming from a very polluted source.

SEWERAGE.

House Drains.—There has been hitherto no system of sewerage in the district. Houses have been drained either into the old highway drains and thence into one of the rivulets or "becks" that run through the township, or into some improperly constructed cesspool; or the sewage has been simply run into the nearest gutter, or on to the surface of the nearest field; and nuisances of the grossest character in all parts of the district have consequently arisen. An injunction, however, was about two years ago obtained against the authority by a neighbouring landowner, restraining them from pouring sewage into the Yeadon beck; and this has necessitated the undertaking of a complete scheme of sewerage. The works for this object, with the exception of the sewage purification works, which are not finally decided upon, are nearly completed, and the house drains will soon be connected, it is stated, with the new sewers. The latter in their construction, method of ventilation, and flushing, &c. are, it was stated, in all respects in conformity with the requirements of the Board, and I did not make this, therefore, a matter of further inquiry. I was surprised, however to learn that the old method of connecting slop-water drains (which, wherever they may run, are found now in the interior of every house) directly with the common sewer, without any break in the continuity of the pipe, was contemplated, and, as I afterwards saw in the case of some new buildings, being provided for.

Excrement and Refuse Removal.—The use of the old privy midden in Yeadon is almost universal; and even as privy middens go, by far the larger number of these structures are more than ordinarily objectionable and offensive. They are mostly of enormous size, and one is supposed often to serve for considerable blocks of property; they are never water-tight, rarely have any foundation or flooring but the bare earth, indeed, are often constructed by the simple piling up of loose rubble stones for walls; or an ashpit may be formed by a simple excavation in the earth. The sanitary authority do not undertake the removal of the refuse, that being left, in many cases without payment, to farmers. The consequence is, that large as the middensteads are, many are not only filled to overflowing, but are quite unapproachable by reason of the refuse strewed for yards around. When a sight of their interior can be gained, it frequently presents a foetid swamp, and foul liquid is often to be seen oozing through the porous walls and flowing for yards across unpaved surfaces in close contiguity to dwellings. The condition of these places is often such that they cannot be used by the tenants as privies, and yet, while for their principal purpose they are useless, they remain in closest proximity to house doors and windows. In short, they constitute nuisances of the gravest kind, and many houses are rendered absolutely unfit for habitation by reason of the filth stored around them. I would mention Temple Bar, Parkinson's Buildings, Clayton's Buildings, Exchange Buildings, Wood's Yard, Kenyon's Yard, Kenyon's Fold, Taylor's Fold, Burrow's Row, Club Row, Queen Street, as well as the courts and squares

about Silver Lane and Well Hill as amongst the places where these defects are found in an extreme degree.

House Accommodation.—Parts of the township of Yeadon are of very ancient date, several of the houses, I am told, dating as far back as the 17th century; and, since little beyond occasional house repairs has been done for their sanitary condition, the latter may be considered to represent the state of sanitary progress of that period. Such houses have, many of them, fallen into a state of decay, are damp, ill-ventilated, and dilapidated, and are unfit for human habitation. I would instance houses in Mill Lane, Wapping, Well Hill, Silver Lane, and others in that neighbourhood. Others of more recent date are, owing to similar sanitary defects, equally unwholesome. Such houses are to be found in Club Row, Appa Garth, Taylor's Fold, and neighbouring property. Cellars, unfit for habitation, are occupied in Starkey's Buildings, as dwelling-houses. The back-to-back method of house construction has been, and is still, a favourite one at Yeadon, even where no obvious reason exists for adopting it. In Hawthorne Crescent, for instance, recently erected, even the houses that have two rooms on the ground floor are built on the back-to-back plan, a room being on each side of the house door. Now if the door of communication between the two rooms had been placed at the *back* of the party wall, instead of in front as is the case, a circulating current of air could be maintained; as it is, the rooms although in "double" houses are of the "well" description. Similarly, in bed-rooms up stairs of back-to-back houses, the entrance door from the staircase might easily be so placed (it is merely a question of running the staircase in a proper direction) as to be at the *back* of the party wall, at the furthest corner from the window; but in new houses at Yeadon (at Hawthorne Crescent and at New Scarborough) the door and window, in houses that I inspected, were close together at the front; so that these also were "well" rooms, and through ventilation could not be obtained. Such defects show a want of intelligent supervision in the construction of buildings. The ventilation of houses is in other ways much neglected, and the practice of providing windows not meant to open largely prevails. I saw one house, one having several rooms, that could not boast of a single window-sash capable of being moved; and there are hundreds of rooms in the district that are similarly destitute of this means of ventilation.

Several houses I found very dirty, evidently requiring the attention of the inspector of nuisances; a few, as for instance two in Manor Lane, were dangerously overcrowded.

Schools.—The board schools are buildings formerly belonging to religious denominations, and, like many of the kind, are insufficiently ventilated. One private or "dame" school was much overcrowded. Thirty children were crowded into a room having a floor space of 126 square feet, *i.e.*, 4 square feet to each child. The room, too, was badly ventilated.

Lodging-houses.—The lodging-houses are not registered, nor are they subjected to proper supervision. One was much overcrowded. It had accommodation, so far as air space is concerned, for 16 persons; but 22 adults and three or four children were received. The overcrowding, too, was of a very indecent description, persons of opposite sexes occupying the same room without any attempt at division. The accommodation in other respects (water-supply, privy, &c.) was deficient in this as in other lodging-houses.

Slaughter-houses.—These, too, are not registered. They are improperly situated buildings, and of defective construction. The slaughtering appears to be carried on in a very public and objectionable sort of way, and in one case I saw the blood of a slaughtered animal running into the sewers. In another the garbage and refuse of the slaughter-house were stored in an ashpit, and this, I was told, was the usual method of disposing of them.

SANITARY ADMINISTRATION.

The rateable value of the district is 16,600*l.*, and the rate for the current financial year, exclusive of that levied by the Sanitary Authority acting as a burial board, will be nearly 3*s.* in the £. Loans for sanitary purposes have been contracted to the amount of 13,800*l.*, *viz.*, for works of sewerage 12,800*l.*, and for street improvements 978*l.* The sewerage works have only recently been undertaken, and the sewers have not yet come into use. When in operation they will no doubt have the effect of removing a large number of nuisances that now exist. Apart from this work, as will be evident from what has preceded, the administration of the authority has hitherto been characterised by much laxity and backwardness. Literally no work worthy of

record has been done in the abatement of nuisances, or towards limiting the spread of disease. The Medical Officer of Health receives a salary of 15*l.* a year, and reports annually as to the mortality of the district. He tells me he has resigned the office. The Inspector of nuisances, who acts also as surveyor, receives for the duties of the two offices a salary of 45*l.* Until recently the officer holding these appointments was over 70 years of age, a fact which may account in part for the small amount of work that has been done in that department. The present officer has only held the appointment for the last three months, and from the experience I had of him he will prove, I believe, a loyal and energetic, and, should the authority be fortunate enough to secure the trained services of a Medical Officer of Health who will judiciously direct his work, a valuable inspector.

JOHN SPEAR.

RECOMMENDATIONS.

1. That the Sanitary Authority secure for their district, failing other means under the powers conferred by the 51st section of the Public Health Act, a supply of pure and wholesome water, constantly laid on at such pressure as will carry the water to the top story of every dwelling-house.*

2. That wells and cisterns proved to be polluted be dealt with under the powers conferred by the 70th section of the Act.

3. That where a house within the district is without a proper supply of water, and such supply can be furnished thereto at a cost not exceeding that authorised by the 62nd section of the Public Health Act, proceedings under that section for enforcing such supply be taken.

4. That the privy-middens which are nuisances injurious to health be removed under the powers conferred by the 94th and following sections of the Act.

5. That the Sanitary Authority take into consideration, now that they are provided with an efficient system of main sewerage, the advisability of adopting a water carriage system of excrement removal; that, should such system be adopted, the waterclosets be constructed external to the dwelling-houses, and for low class or tenement property, on such plan as is adapted to the special requirements of such property.

6. That the removal of house refuse and (should the water-carriage system not be decided upon) the removal of excrement from the neighbourhood of dwellings and the cleansing of privies, at intervals not exceeding one week, be provided for and duly enforced; that the privy receptacle required to be provided be of such form and size as may be adapted to such frequent removal and frequent cleansing.

7. That the Authority themselves undertake the removal of refuse and the cleansing of privies.

[On the subject dealt with in this and the three preceding paragraphs the Authority will with advantage consult the Official Report of the Local Government Board as to certain means of preventing excrement nuisances in towns and villages.]

8. That the provisions of section 150 of the Public Health Act, as to the paving of streets, courts, squares, &c. be carried into effect.

9. That the provisions of the 92nd section as to systematic inspections of the district and the provisions of section 94 and following sections as to the abatement of nuisances be carried into operation.

10. That lodging-houses and slaughter-houses be registered and placed under proper regulations and systematic inspection.

11. That the Sanitary Authority make some provision either alone or in combination with a neighbouring authority, or by contract with some body having the necessary accommodation, for the immediate isolation of cases of infectious disease. That efforts be made to obtain early information of cases of infectious sickness, and that at least arrangement be made with the registrar for the immediate supply to the medical officer of health of notice of any death from such disease. That the "provisions against infection" contained in the 120th and following sections of the Public Health Act be duly enforced.

* The filtration of the water by the Company has been suggested, but this alone will not suffice. The effect of filtration, as it is usually applied, is limited to the more or less perfect removal of suspended matters, while dissolved impurities are only acted upon to a slight extent; and even for this limited action filter-beds require the most careful and liberal management. The water supply of a town should be pure at its source.

12. That unless the Local Government Board by order under the 191st section of the Public Health Act prescribe the duties of the medical officer of health, the authority define the duties of that officer, and that the instructions to the inspector of nuisances be revised. The authority will with advantage consult the instructions laid down for such officers by the Local Government Board.

13. That the present byelaws, more especially those relating to house drainage, and to the construction and ventilation of dwellings, be revised; and that in effecting such revision the model byelaws recently issued by the Local Government Board be consulted.

APPENDIX.

REPORT on TWO SAMPLES of WATER received from the Medical Department of the Local Government Board, June 27, 1879.

Samples contained in two Winchester quarts each, stoppers tied over and secured by seals, seals unbroken. Each bottle labelled—

No. I. "Old Reservoir, 25/6/79."

No. II. "New Reservoir, 25/6/79."

Both waters are turbid and become clear but very slowly owing to the fine nature of the suspended particles (clay). Both have a slight taste and smell resembling that of moist clay. The small amount of deposit yielded after a time by each, contains various low vegetable forms and a few minute animalculæ. The deposit from No. II. is brown, owing to the presence of oxide of iron. The waters are very soft, and contain traces only of nitric acid. No. I. is almost free from ammonia; No. II. contains a small amount. Both waters yield, however, a very large proportion of albuminoid ammonia. Judging, however, from the almost total absence of nitric acid and the relatively small amount of chlorine present, this albuminoid ammonia is most probably derived from vegetable contamination and is not due to animal contamination, and is therefore far less objectionable than if it were due to the latter. Nevertheless, even then the proportion is far too high, and in their present condition the waters are unfit for domestic use.

No. II. is in nearly all respects somewhat worse than No. I.

The analytical details are given in the table annexed.

	No. I.	No. II.
Appearance - - - - -	turbid	turbid.
Colour - - - - -	greenish yellow	brownish.
Taste - - - - -	slight	slight.
Smell - - - - -	"	"
Deposit - - - - -	trace	a little.
Nitrous acid - - - - -	none	minute trace.
Phosphoric acid - - - - -	trace	strong trace.
Metallic impurities - - - - -	none	none.
Hardness, before boiling	—	—
„ after „ - - - - -	—	—
	Grains per gall.	Grains per gall.
Oxygen, absorbed from permanganate - - - - -	0·0245	0·0245
Total dry residue - - - - -	8·26	9·24
Consisting of { volatile matters - - - - -	1·40	1·68
{ fixed salts - - - - -	6·86	7·56
Chlorine - - - - -	0·77	0·91
Nitric acid - - - - -	0·05	0·05
Ammonia - - - - -	0·0014	0·0056
Albuminoid ammonia - - - - -	0·0146	0·0157

A. DUPRÉ.

Westminster Hospital,
July 4, 1879.

REPORT on ANALYSIS of WATER marked "Old Reservoir," received from ALFRED MARSHALL, Esq., for the YEADON WATERWORKS COMPANY. January 14, 1879.

The water contains in grains per gallon:—

(1.) Chlorides equal to common salt - - - - -	-	-	-	1·23
Nitrates of lime, &c - - - - -	-	-	-	none.
Sulphates and carbonates of lime and magnesia - - - - -	-	-	-	1·84
Silica, alumina, and oxide of iron - - - - -	-	-	-	traces.
Salts of lead and other poisonous metals - - - - -	-	-	-	none.
(2.) Volatile and organic matter - - - - -	-	-	-	0·43
Total dissolved solids - - - - -	-	-	-	3·50

(1.)	Containing chlorine	-	-	-	-	-	-	-	0.745
(2.)	" ammonia	-	-	-	-	-	-	-	0.0044
"	also organic ammonia	-	-	-	-	-	-	-	0.0098

Corresponding to nitrogenous organic matter about 0.098 grains per gallon.

REPORT on ANALYSIS of WATER marked "New Reservoir," received from ALFRED MARSHALL, ESQ.,
for the YEADON WATERWORKS COMPANY. Received January 14, 1879.

The water contains in grains per gallon

(1.)	Chlorides equal to common salt	-	-	-	-	-	-	-	1.43
(2.)	Nitrates of lime, &c.	-	-	-	-	-	-	-	1.69
	Sulphates and carbonates of lime and magnesia	-	-	-	-	-	-	-	3.46
	Silica, alumina, and oxide of iron	-	-	-	-	-	-	-	traces.
	Salts of lead and other poisonous metals	-	-	-	-	-	-	-	none.
(3.)	Volatile and organic matter	-	-	-	-	-	-	-	0.84

Total dissolved solids - - 7.42

(1.)	Containing chlorine	-	-	-	-	-	-	-	0.86
(2.)	" nitric acid	-	-	-	-	-	-	-	1.3
	Corresponding to oxidised ammonia	-	-	-	-	-	-	-	0.351
(3.)	Containing ammonia	-	-	-	-	-	-	-	0.0039
"	also organic ammonia	-	-	-	-	-	-	-	0.00896

Corresponding to nitrogenous organic matter about 0.089 grains per gallon.

Both waters contain a little sediment; the quantity is greater in the old reservoir water. The new reservoir water is nearly colourless, while that of the old reservoir has a very faint yellow tint.

THOMAS FAIRLEY, F.R.S.E., &c.,
Public Analyst.

16, East Parade, Leeds,
January 16, 1879.

MORTALITY STATISTICS for the Urban Sanitary District of Yeadon for the Six Years 1873-78.*

Year.	Popula- tion.	Total Deaths.	Deaths under 1.	Death Rate per 1,000 per Annum.	Zymotic Rate per 1,000	Small-pox.	Measles.	Scarlet Fever.	Diphtheria.	Whooping Cough.	Fever.	Diarrhoea.	Other Zymo- tics.	Phthisis.	Bronchitis and Pneumonia.	Heart Disease.
1873	-	5,400	103	33	19.1	1.5	1	-	2	-	2	3	4	12	16	4
1874	-	5,500	123	35	22.4	2.2	-	3	1	-	4	4	1	15	16	4
1875	-	5,550	125	31	22.5	2.5	-	-	-	1	7	6	1	23	21	8
1876	-	5,600	121	28	21.5	1.8	-	3	-	2	2	3	5	13	26	3
1877	-	5,650	126	34	22.3	2.5	-	1	-	8	4	1	3	14	24	6
1878	-	5,700	159	45	26.7	6.0	-	-	21	-	5	4	2	8	24	8
Average of 6 years, 1873-78.	5,550	125	34	22.5	2.8	-	-	-	-	-	-	-	-	-	-	-
1st quarter 1879 -	5,700	71	14	49.9	11.2	-	-	11	1	1	3	-	1	4	7	6

* Including the deaths that occurred in the union workhouse amongst paupers belonging to Yeadon.

LONDON:

Printed by GEORGE E. EYRE and WILLIAM SPOTTISWOODE,
Printers to the Queen's most Excellent Majesty.

For Her Majesty's Stationery Office.

[6062.—100.—10/79.]